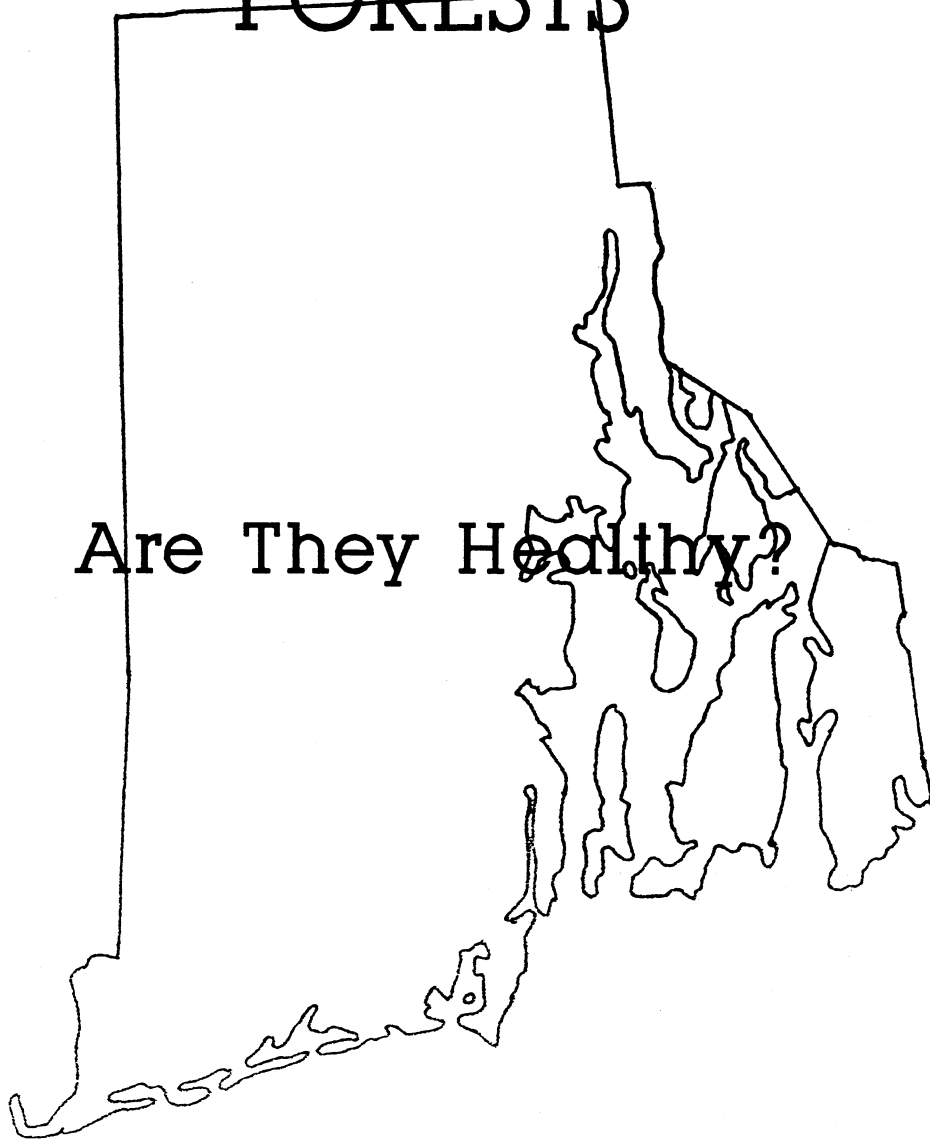


RHODE ISLAND'S FORESTS

Are They Healthy?



Division of Forest Environment
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INTRODUCTION

If Rhode Island's forests were human beings, Their story would certainly make for an intense drama with their ability to withstand many and varied threats to their existence and their remarkable ability to come back no matter the adversity. Despite their gross mistreatment they still have provided many benefits to those of us who have so badly abused or ignored them.

If the question is asked, are Rhode Island's forests healthy? Given their history we could only conclude that if they are not healthy, they are definitely survivors. Certainly they have withstood everything that we have caused to be done to them over the last 400 years. Indeed nearly every abuse they have suffered has been caused by man either directly or indirectly. We have overcut them, set fire to them, and introduced all of the most destructive pests with which they have had to deal. Chestnut blight, Gypsy moth, Dutch elm disease, white pine blister rust, and lately Hemlock woolly adelgid have been visited upon our forests by mans doing. Only hurricanes have been able to approach the amount of havoc dealt by man.

Much of the abuse to Rhode Island's forest has occurred in this century, but concerns about local timber shortages have been evident as far back as 1820 (Ferguson 1957). A quick glimpse into Rhode Island's past will show the changes that have occurred to it's forest since the beginning of this century.

The peak for Rhode Island's lumber production occurred in 1907, when 32 million board feet were produced. Considering that there only 240,000 acres of forest (about half of what exists today), there must have been widespread cutting in evidence. Lumber production dropped off dramatically, with production at only 10 million board feet in 1920, where it had been in 1890. It is unclear what triggered the rise in lumber production, but Chestnut blight certainly brought about its demise. It was estimated that Chestnut comprised nearly one third of Rhode Island's forest and was its fastest and best growing species. Its workability as lumber also added to its utilization.

Much of Rhode Island's forest continued to be heavily relied upon for fuelwood until coal and later oil became the favored sources of energy. Acreage that was not cut likely suffered from fire. In the period from 1926 to 1952, the average acreage burned was 6,800 per year. A total of 165,000 acres were burned during this period. The 1938 hurricane added its destruction to the forests as well, leveling many thousands of acres of trees in its wake.

Moving to 1944, the forests of Rhode Island were described as follows: "The Recent past has dealt harshly with Rhode Island's forests; over-cutting, lack of protection from fire, the 1938 hurricane, have combined to wipe out nearly all merchantable timber." (Buttrick 1944) Despite this gloomy situation, the author held out hope. "...although they have been rendered currently unproductive, by continued abuse, these forests are capable, if well managed, of contributing materially to the state's economic and social well being." (Buttrick 1944)

Soon after World War II, the forests stopped being abused. But rather than being managed as hoped, they were now being ignored. In 1953 the following appraisal was made: "The timber on the forest land is little used. It is growing more than six times faster than it is being cut...Yet it would be difficult to find a comparable forest area where the timber growing stock is so depleted." (Ferguson 1957)

So we have moved from an abusive phase into one of benign neglect. In an editorial calling our forests our most valuable resource, Alfred Hawkes, the Executive Director of Audubon Society of Rhode Island said, "Without our forests, Rhode Island's soils and freshwater resources would soon disappear. In spite of this importance, we...regard our forests as some sort of poor relative. We tolerate them because they are there, we nod at them sweetly when they help us out, and we get rid of them when they are in our way. We have made no attempt to understand our forests...We have done little to protect them from random, wasteful, and even destructive exploitation." (Hawkes 1979)

It is against this backdrop of abuse and neglect that we now consider whether or not our forests are healthy.

FOREST HEALTH

Although Rhode Island's forests have been subjected to more abuse and stress than many other forests, they are not unique. Forests universally exist because of their collective ability to withstand stress from drought, fire, forest succession, insects, and diseases. Concern for forest health is now increasing as we come to realize how many of these stresses are man caused. Not only do we realize that we have introduced pests and fire to our forests, we now know that we are creating potential global changes as well. We as a nation are coming to realize that we may be pushing our forests farther than even they, with their proven ability to withstand abuse, can continue to tolerate.

Forest health cannot be measured by taking a single observation; it must be monitored over time. This report will not, therefore be a definitive report on the health of Rhode Island's forest. It will provide a baseline along with other data which will serve to monitor changes in the condition of our forests.

The object of this report is to assess how recent stressors have affected our forests. We will define the health of forests by the various groups of forests common to Rhode Island and the stresses they are facing. By most standards, Rhode Island's forest are healthy. They are not on the verge of widespread collapse or are barely surviving.

FOREST TYPES OF RHODE ISLAND

Oak/hickory Group.

This group alone is the most predominant forest group in Rhode Island, existing on 256,100 acres or 69% of the total forested area. Any condition adversely affecting this group will have a significant impact statewide. This group is composed of many different species, primarily northern red oak,, scarlet oak, black oak, and red maple mixed with central hardwoods. Although named as part of the group, hickory is a very minor species throughout the group.

The biggest impact to this group was the Chestnut blight which has eliminated Chestnut from the overstory in this group. Once chestnut composed between 30 and 40 percent of the forest in the state. Chestnut sprouts continue throughout the group, but each succumb to the blight before reaching maturity.

Since the early 1900's the Gypsy moth has been a visitor in this forest group. The entire state was first declared infested in 1915, only six years after it was initially identified in Providence. The heaviest defoliations have occurred in the 1980's, with 1981, 1982, 1985, and 1986 being the heaviest. Since 1988, the gypsy moth has been absent to any noticeable degree.

Although the Gypsy moth does not directly cause trees to die, it does weaken them to allow other pathogens such as the Two lined chestnut borer and armellaria root rot to kill the trees. Mortality has occurred throughout this group, but it has been highly variable. Heaviest mortality approaching 50% of the basal area has occurred on several dry ridge tops. No estimate of the mortality has been made.

Other pests of concern to this group are the Oak leaf tier complex which has caused some mortality in northwestern and northeastern Rhode Island in the early 1980's (just ahead of the Gypsy moth), and the Orange striped oak worm which had caused significant defoliation in Scituate and North Kingstown, Rhode Island in 1985 and 1986. Both of these pests are absent at this time.

Oak/pine Group.

This group, similar to the oak/hickory group is also composed of mixed oak species with white pine often comprising half of the basal area of the group.

Gypsy moth is also the most significant pest in this group. In heavy infestations, the gypsy moth first defoliates the oak component then often will move into the pines and defoliate them as well. Many of the suppressed and overtopped white pines have died as a result of this defoliation. Although the codominant pines were often defoliated too, most seem to have survived even complete defoliations. Dominant pines, even in the midst of heavy populations were rarely totally defoliated. Oak mortality in this group most often occurred in suppressed whit oaks.

White pine weevil is evident in the pines, but the partial shade provided by overstory oaks serves to reduce the amount of damage done by this pest.

White Pine Group.

White pine occurs in virtually pure stands on 17,000 acres throughout Rhode Island. These stands usually occur on dry sandy soils where other species cannot compete. Many of these sites were abandoned fields.

The most significant pest historically has been the white pine blister rust. An eradication program to eliminate ribes species was undertaken in Rhode Island in the 1920's and stopped in the 1960's. Importation of ribes is still monitored by the Division of Agriculture, with western Rhode Island having a high risk of infection and eastern Rhode Island being moderate.

White pine weevil has been widespread affecting nearly every tree in these pure stands. Being a pioneer species, the white pine often grows in full sunlight where the weevil is much more active. Although never fatal, the weevil does reduce the quality of white pine as a timber tree.

White pines are sensitive to air pollutants, especially ozone. Although no widespread symptoms are evident, there is concern that white pine growth is less than previous studies have indicated is possible.

Elm/ash/red maple Group.

Most of this group is composed of nearly pure stands of red maple growing in wetlands throughout the state. Very few native or planted elms remain in the state as a result of Dutch elm disease. Ash occurs on better sites along stream banks, but is not a major species in Rhode Island.

Red maples do not have any serious pests specifically, but they are very prone to butt rot. Red maples usually have poor form and considerable defect which renders them of little value as timber. With their characteristic thin bark, they are susceptible to wounding also. Red maples are very vigorous sprouters, however; and they often become a greater component of a forest following a disturbance than they were before. The young sprouts are preferred food for deer and other browsing wildlife.

Hard Pine Group.

This group is comprised mostly of pitch pine with the remainder made up of red cedar. Pitch pine occurs most commonly along the coastal areas of Rhode Island on poorer, shallow, sandy soils. Red cedar stands occur as nearly pure stands on recently abandoned agricultural land.

Pitch pine and red cedar are both intolerant of shade and therefore do not continue to survive as forest stands are left undisturbed. Pitch pine produces serotinous cones which open after fire has burned over an area. As a result, pitch pine is often reestablished by fire. Given the absence of large fires in Rhode Island, the species is likely to decline in area. There are no serious pests affecting the pitch pine.

Red cedar is also a pioneer species. Many birds and other small game feed on the seeds of red cedar and aid in the dispersal of its seed. Fire has been the most serious threat to this species in the recent past. Lack of suitable seed bed will likely bring the number of red cedar down in the future as farmlands have nearly all been abandoned in the state.

Northern Hardwoods Group.

This group which consists of sugar maple, yellow birch, beech, and red maple occurs in scattered areas primarily in northwestern Rhode Island on better soils.

In this group, sugar and red maples are the most common, with only occasional yellow birch and beech found as components. This forest type is probably the healthiest in the state due both to its existence on better sites and that it occurs in scattered small areas making it difficult for the various stressors to move from one stand to another. Few of the beech trees have been affected by beech scale. The sugar maples were also similarly spared any significant defoliation by pear thrips in the mid 1980's.

Wildland Fires : 1980 - 1992

As discussed earlier in this report, fires burned a great deal of the forest in Rhode Island earlier in this century. Since the late 1950's and most recently in the 1980's, fire has diminished considerably as a factor to forest health. Of the lowest ten years in terms of wildland acreage burned, eight of them have occurred in the period from 1980 to the present. The five year average for acres burned between 1987 and 1991 is 282.7 acres. The absence of fire is at least some testimony to our recognition that forests need our protection.

Literature Cited.

Buttrick, P.L. 1944; The Forests of Rhode Island, Preview of Their Postwar Condition; American Forests, Volume 48 Number 9; 440-446.

Ferguson, Roland H. and John R. McGuire. 1957. The Timber Resources of Rhode Island; USDA Forest Service, Northeastern Forest Experiment Station; 38pp.

Hawkes, Alfred L. 1979; Rhode Island's Most Valuable Resource, Rhode Island Audobon Report, Vol. 13, No. 8